

REMARKS

Claims 1-22 remain in this application, and Claims 23-24 have been added in this amendment. The Applicant respectfully requests reconsideration and review of all claims pending in this application.

**I. FORMAT OF AMENDMENT AND ADDED CLAIMS**

The Examiner asserts that the amendment filed on May 31, 2002 does not comply with 37 C.F.R. § 1.173(b). Although the Applicant disagrees with the Examiner, the Applicant has made several comments in this section under 37 C.F.R. § 1.173(b), and has reformatted the May 31, 2002 amendment, as shown in the "VERSION WITH MARKINGS TO SHOW CHANGES MADE," to expedite processing of this application.

Note that, in the reformatted amendments, there have been no amendments or changes made to the claims submitted to the Examiner on May 31, 2002. In particular, in the May 31, 2002 amendment, Applicant amended Claims 9 and 17 of the claims submitted in the preliminary amendment dated April 6, 2001; there have been no additional amendments or changes made to Claims 9 and 17 in the reformatted amendments. Claims 1-3 were allowed in U.S. Patent No. 5,892,655, and Claims 4-8, 10-16, and 18-22 were added in the Preliminary Amendment dated April 6, 2001. There have been no additional changes made to Claims 1-3, 4-8, 10-16, and 18-22 in the reformatted amendments.

Claims 23 and 24 have been added in this amendment to further clarify aspects of the present invention.

Per 37 C.F.R. § 1.175, in the reformatted amendments, the Applicant has indicated that Claims 9 and 17 have been "Once Amended," and in the Preliminary Amendment dated April 6, 2001, the Applicant indicated that Claims 9 and 17 were new

(or added). In the Preliminary Amendment dated April 6, 2001, the Applicant indicated that Claims 4-22 were new (or added). The Applicant has also added Claim 23, which depends from once amended Claim 9, and Claim 24, which depends from once amended Claim 17. Claims 23 and 24 are denoted as "New."

The Applicant has included the complete text of once amended Claims 9 and 17, and new Claims 23 and 24. The Applicant has also included a "VERSION WITH MARKINGS TO SHOW CHANGES MADE" section that shows the changes made in the May 31, 2002 amendment, and the new Claims 23 and 24.

Per 37 C.F.R. § 1.175, the Applicant provides the status of the claims, and states that Claims 1-24 are pending in this Reissue application.

Per 37 C.F.R. § 1.175, the Applicant provides the support in the disclosure for the claims, and states that support for once amended Claims 9 and 17 can be found in the disclosure at col. 2, lines 14-17, col. 2, line 23, col. 2, lines 30-36, and Figs. 1-2, and that support for new Claims 23 and 24 can be found at Col. 2, lines 30-33, Col. 3, lines 1-14, and Figs. 1-2.

## **II. REISSUE DECLARATION**

The Examiner asserts that the reissue oath is defective, and although the Applicant disagrees, the Applicant has submitted a signed Revised Reissue Declaration to expedite processing of this application.

The Examiner quoted the following language: "Applicant must identify a single word, phrase or expression . . . or in an original claim (emphasis by Examiner) which renders the original patent wholly or partly inoperative or invalid." In the quoted MPEP language, one must state that the "original claim" makes the "original patent" inoperative or invalid. Thus, the "original claim" language in the MPEP refers to the original patent

claim that issued. This is what the Applicant has referred to at paragraph 10 of the reissue declaration dated April 5, 2001, and is also what the Applicant has referred to in the Revised Reissue Declaration.

### **III. REJECTIONS BASED ON PRIOR ART**

The Examiner rejected Claims 1-22 under 35 U.S.C. § 103(a) as being unpatentable over Skutt (U.S. Patent No. 5,734,149), and Wilens U.S. Patent No. 4,605,058). The Examiner also stated that "it would be obvious to combine the teachings of Wilens and Skutt for someone versed in the art." The Applicant traverses this rejection for the reasons stated below.

The Applicant first provides background regarding the invention to more clearly show that the invention is patentable over the cited art. The Applicant also summarizes the cited Skutt and Wilens references and the purposes of the cited references to show why it would not be obvious to combine them in the way suggested by the Examiner, that combining the two would render both references unsatisfactory for their intended purposes, and that both references teach away from being combined. An affidavit, executed by the inventor William Grouell, under 37 C.F.R. § 1.132, is also provided.

#### **A. BACKGROUND**

The present application is directed to a shield (or heat sink) for use with a heat generating device, such as a hard disk drive containing a heat emitting motor. Specifically, the shield is used to dissipate heat from the hard disk drive (or more particularly the heat emitting motor within the disk drive) to the atmosphere. The shield is formed from a thermally conductive material and includes a plate and a plurality of louvered fins. (Decl. ¶ 4.)

Prior to the Applicant's conception of this invention, neither heat shields nor heat sinks were used in conjunction with hard disk drives. In the past, disk drives did not produce very much heat. Thus, there was no need to use heat shields or heat sinks with disk drives. (Decl. ¶ 5.)

In contrast, hard disk drives in use today generate considerable amounts of heat because of a substantial increase in disk drive power and storage capacity, a substantial increase in the rotational speed of the rotating platters of disk drives, and the increased heat generated by the spindle motors that are required to rotate the platters at the increased rotational speed. Further, based on consumer demand for more compact computer systems, disk drives in use today must only occupy a minimum amount of space. (Decl. ¶ 6.)

To address the issue of overheating, prior art disk drives relied primarily on air spacing, not heat dissipation through a separate heat sink, to cool the disk drives. This prior art method disadvantageously required that the disk drives be housed in chassis that formed a large open space within the disk drive to allow for cooling via air spacing. (Decl. ¶ 7.) Other prior art disk drives also relied on the chassis in which the disk drive was housed as a make-shift heat sink to cool the disk drive by way of heat dissipation (through the cover of the chassis). The make-shift heat sinks, i.e., the chassis covers, did not dissipate heat effectively. These other disk drives, consequently, required greater space while still having poor heat dissipation qualities. (Decl. ¶ 8.)

## **1. THE INVENTION OF THE '655 PATENT**

As stated in the '655 patent, "The present invention addresses dissipation of this heat without increasing the volume occupied by the individual drive." Col. 1, lns. 29-31. The present inventor addressed the heat dissipation problem by providing a plate that includes fins that are slanted up from the plate. (Decl. ¶ 9.)

The '655 patent further provides: "To facilitate transfer of heat from plate 16 to the surrounding atmosphere, fixed louvers 18 or fins are struck up from the plate at various location. . . . In use, because the depression 17 is in contact with the drive motor, the heat of the motor is transferred to the plate 16 and **by means of the louvered fins** to the surrounding air." Col. 2, Ins. 30-45 (emphasis added). (Decl. ¶ 10.) In other words, the plate is in physical contact with the hard disk drive for the purpose of conducting heat from the hard disk drive into the plate, and thus into the louvers. The heat in the plate and the louvers is then dissipated (i.e., radiated) into the atmosphere. The louvered fins facilitate the dissipation, or radiation, by increasing the surface area of the shield that is exposed to the atmosphere. (Decl. ¶ 11.)

In one embodiment, the louvered fins are slanted up from the plate at an acute angle. As a result, space is conserved while allowing efficient heat dissipation. Specifically, because of the consumer demand for compact electronic systems, disk drives must be positioned close to one another. Using louvered fins that are slanted up at only an acute angle, as opposed to being slanted up at a ninety degree angle, allows the disk drives to be positioned in closer proximity to one another, satisfying consumer demands for compact systems while meeting the underlying purpose of dissipating heat from the disk drive. (Decl. ¶ 12.)

The invention also has the additional advantage of using a separate heat sink to dissipate heat, as opposed to using the chassis of the disk drive. The use of a separate heat sink permits one to change the heat sink material to accommodate disk drives that generate different amounts of heat, as opposed to having to change the entire material from which the chassis is made. (Decl. ¶ 13.)

## B. EXPLANATION OF THE SKUTT AND WILENS REFERENCES

The following is an explanation of the cited references.

### 1. The Skutt Reference

The Skutt reference pertains generally to a kiln assembly that includes an electric heater and a hinged control box that houses control components for controlling the heat (i.e., temperature and duration) provided by the electric heater. Specifically, electronic controls 86 and relays/transformers 88 are attached to the front side 58 of the hinged control box 36 for controlling the heat that is provided by the electric heater. See Figure 4 and col. 4, lines 49-56. The stated purposes of Skutt include “[1] improv[ing] the thermal protection provided for the controls contained within the control box of the kiln assembly; [2] increase[ing] the cooling effect of air within the control box; and, [3] creat[ing] a chimney within a control box attached to a kiln assembly, wherein the chimney increases the dissipation of heat from the controls contained in the control box.” Col. 1, Ins. 51-63.

Because one of the purposes of Skutt is to **insulate** (“increasing thermal protection”) the control components from the kiln, which is a primary source of thermal energy, the Skutt reference allows only minimal physical connection between the control components and the kiln. This is shown in Figures 6 and 7, where the only direct physical connection between the control box 36 (which houses the control components) and the heated kiln is a latch (i.e., closure device 60) and a hinge (i.e., pin/receptacle 30, 38). See col. 4, lines 17-21.

As shown in Figure 4, a thermally insulated baffle 68, which includes a metal plate 70 and fiber insulation 72, is provided inside the control box 36, between the front side 58 of the control box 36 (where the electronics are housed) and the kiln. The fiber

insulation 72 insulates the air within chamber 80 (which is created by the insulating baffle 68) from the warm air surrounding the kiln. Thus, the thermally insulated baffle 68 furthers the object of insulating the control panel from the kiln, also furthering the first object of Skutt. See Figure 5; and col. 4, lines 25-35.

The thermally insulated baffle 68 not only minimizes the amount of heat that can be conducted into the control box 36, but it forms a "chimney" 134 between the control box 36 and the kiln for circulating warm air away from the control box 36, meeting the objective of providing a chimney, which is the third object of Skutt. See Figure 6 and col. 6, lines 5-12.

As shown in Figure 4, air vents (i.e., openings) 102, 108 are formed in the top and bottom of the control box 36 through the use of louvers 100, 106. By angling the bottom louvers (i.e., 106) away from the kiln, cool air (indicated at arrows 110, 82, and 104) is allowed to circulate up through the insulated chamber (or "chimney") 80. See col. 4, lines 35-39; and col. 5, lines 20-33. This furthers the second object of Skutt, which is to increase the cooling effect of air within the control box.

## **2. The Wilens Reference**

Wilens is directed to a springy metal retainer 10 (in the shape of a "W") for holding a flat, rectangular solid state package of electronic components 25 (e.g., transistors, capacitors, or resistors). See col. 1, lines 8-11; and col. 2, lines 53-60. Specifically, the metal retainer 10 includes tabs or tongues 28 for mounting the retainer 10 on a circuit board, and is constructed to dissipate heat from a heat generating electronic component 25. See Figure 2; col. 1, lines 43-47; and col. 2, lines 31-37.

Wilens also includes "a plurality of tabs 24 . . . to define openings or louvers 26 which are spaced apart in a direction longitudinally of the retainer 10 . . . ." Wilens, Col.

2, Ins. 29-32. "Heat generated in the electronic package [components] 25 is conducted away by the walls [] of the retainer. . . . Heat is further dissipated by **convection** through the louvers 26 and the holes 30 in the side walls []." *Id.* at Col. 3, Ins. 3-9. Thus, as stated in Wilens, the purpose of the louvers is to allow heat to dissipate by convection (by allowing air to flow—uninhibited—through the louvers 26 formed by the tabs 24).

**C. IT WOULD NOT BE OBVIOUS TO COMBINE THE SKUTT AND WILENS REFERENCES**

The Applicant respectfully disagrees with the Examiner's conclusion that the present invention is obvious, based on three premises: (1) there is not an explicit or implicit suggestion in the cited references to combine the Skutt and Wilens references, nor is there any suggestion within the knowledge of one of ordinary skill in that art, such as the Applicant, to combine the two references; (2) combining the Skutt and Wilens references would render both the Skutt and the Wilens references unsatisfactory for their intended purposes; and (3) both the Skutt and the Wilens references teach away from combining the structures to form a different structure in the manner suggested by the Examiner. (Decl. ¶ 24.)

**1. There Is No Suggestion In The Cited References, Neither Explicit Nor Implicit, Nor in The General Knowledge of One Skilled In The Art To Combine the Skutt and Wilens references.**

To sustain a rejection that an invention is "obvious in view of a combination of references, there must be some suggestion, motivation, or teaching in the prior art that would lead a person of ordinary skill in the art to select the references and combine them in a way that would produced the claimed invention." See Karsten Mfg. Corp. v. Cleveland Golf Co., 242 F.3d 1376, 1385 (Fed. Cir. 2001). The suggestion must be either explicit or implicit, or there must be a suggestion in the knowledge generally



available to one of ordinary skill in the art. MPEP § 2143.01. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." Id.

Contrary to the Examiner's assertion, there is no such motivation. Specifically, as a whole, the nature of the problems to be solved by the Skutt and Wilens references are different, and there is no explicit or implicit teaching within the Skutt and Wilens references to combine the two references. Further, there is no suggestion within the general knowledge in the art that would lead one of ordinary skill to combine the two references. (Decl. ¶ 25.)

The nature of the problem to be solved in Skutt is to insulate the control component(s) from the kiln, which releases thermal energy. The control component(s) is insulated from the kiln by a thermally insulating baffle, which also forms a chimney. Louvers are used to create air vents (similar to the air vents found in a house) for directing air into, and out of, the chimney.

The nature of the problem to be solved in Wilens, on the other hand, pertains to the situation where the object releasing heat and the object to be kept cool are the same, i.e., electrical components. Wilens addresses this problem by using a springy metal retainer in direct contact with the electrical component. Thus, the problems to be addressed are different: Skutt is for insulating an object to be kept cool from an object releasing heat, and Wilens is for dissipating heat from an object creating heat. As a result, there is neither an explicit nor an implicit teaching in the cited references that would suggest one of ordinary skill to combine the two references.

Indeed, as discussed above, there was not a previous need to dissipate heat from disk drives, and when such a need arose, other disk drives simply used a chassis having a large volume for air spacing and the same chassis top as a make-shift heat

sink. No one used a separate heat sink, apart from the chassis, to dissipate heat from a disk drive. The inventor states in his declaration that he is not aware of anyone who used a separate heat sink, apart from the chassis, to dissipate heat from a disk drive. Thus, it would not have been obvious to combine the structures of the Skutt and Wilens patents in the manner suggested by the Examiner. (Decl. ¶ 28.)

Thus, there is no motivation, based on the nature of the problem to be solved, the teachings of the prior art, nor the general knowledge in the art, to combine the Skutt and Wilens references.

**2. Combining The Skutt And Wilens References Would Render Both References Unsatisfactory For Their Intended Purposes.**

The purpose of the "louvers" in Skutt is to direct cool air through a chamber in which a control component(s) to be kept cool resides. This accomplishes the overall goal of keeping the control unit cool. (Decl. ¶ 30.)

The purpose of the "louvers" in Wilens is heat convection. Thus, tabs are formed on the walls of the object disclosed in Wilens, and the tabs form unimpeded openings (also referred to, in Wilens, as "louvers"). The openings allow air to flow out of the tabs unimpeded, furthering the heat convection purpose of the openings. (Decl. ¶ 31.)

Incorporating the "louvers" disclosed in Skutt in place of the tabs disclosed in Wilens would render the Wilens springy retainer unsatisfactory for its intended purpose because the Skutt "louvers" would impede the free flow of air, whereas the openings formed by the Wilens tabs permit air to flow freely. This occurs because the purpose of the Skutt "louvers" is to **direct** air, whereas the purpose of the openings formed by the Wilens tabs is to permit heat convection, i.e., unimpeded air flow. As a result, combining the Wilens and Skutt references in the manners suggested by the Examiner would render both references unsatisfactory for their intended purposes. (Decl. ¶ 32.) It is therefore not obvious to combine the two references.

**3. The Skutt And Wilens References Teach Away From Combining The References.**

Skutt actually teaches away from using the air vent as a heat dissipater. Skutt discloses a control box that houses a control component(s) that is designed to be insulated from a heat generating device (as opposed to a heat sink). The main objective of Skutt is to create a control box for a kiln that is kept cool, in part, by not conducting heat from the kiln. According to the specification, the control box is only connected to the kiln through hinges and a clasp, which minimizes the "direct thermal contact" with the kiln, and creates a large air space, or "chimney" between the control box and the kiln. See Figures 6 and 7; col. 4, lines 17-22; and col. 6, lines 5-12. (Decl. ¶ 33.)

This is the complete opposite of the present invention, which provides direct physical contact between a shield (i.e., a plate and louvers) and a hard disk drive for the purpose of dissipating heat from the hard disk drive. Thus, it is clear that Skutt actually teaches away from using louvered air vents to dissipate heat from a heat generating device, such as a hard disk drive. (Decl. ¶ 34.)

Because there is no motivation or teaching to combine Skutt and Wilens, and because Skutt and Wilens, either alone or in combination, fail to disclose the use of louvers (as described in the present application) to "dissipate heat to the atmosphere" as required by Claim 1, or "dissipate heat from said plate" as required by Claims 4 and 9, the Applicant asserts that Claims 1, 4, and 9, as well as Claims 2-3, 5-8, and 10-16, which depend from the aforementioned independent claims, are novel over the Skutt and Wilens references.

**IV. THE CLAIM IS ALLOWABLE WHETHER OR NOT THE PREAMBLE IS CONSTRUED AS A CLAIM LIMITATION**

The Examiner asserts that the preamble to the added claims is not given any weight. The Applicant does not address this assertion except to note that, with respect to independent Claims 1 and 4, and (once amended) independent Claim 9, those claims, and all claims depending therefrom, are allowable over the cited art whether the preamble is deemed a limitation or not (i.e., whether the heat shield is used with a disk drive or not) for the reasons stated above.


Moreover, the Applicant notes that once amended independent Claim 17 is directed to a computer storage system, and therefore the Examiner's preamble assertion is moot. If the Examiner has not considered patentability of the "computer storage system" of Claim 17 under the premise that a preamble is not given weight when determining patentability, the Applicant requests the Examiner consider patentability of Claim 17. See Amendment dated May 31, 2002 at pp. 9-10. If the Examiner maintains the rejection, however, the Applicant traverses the rejection for the reasons stated above, and for the reasons stated in the amendment dated May 31, 2002.

In sum, for the reasons stated above, the Applicant submits that Claims 1-24 are in condition for allowance. Reconsideration and allowance of the claims is respectfully requested, and a timely Notice of Allowance is solicited. To the extent it would be helpful to placing this application in condition for allowance, the Applicant encourages the Examiner to contact the undersigned counsel and conduct a telephonic interview.

Serial No. 09/828,246  
September 18, 2002  
Page 16

Our check in the amount of \$36.00 is enclosed for the later presentation of two total claim in excess of twenty, pursuant to 37 C.F.R. § 1.16(c). In addition, the Commissioner is authorized to charge any shortage in the fees due in connection with the filing of this paper to Deposit Account No. 50-0639.

Date: September. 18, 2002



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Enclosures: Affidavit of William Grouell  
Declaration of William Grouell

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE CLAIMS:**

The following claims have been amended:

9. (Once Amended) A shield for use with a hard disk drive having a heat emitting motor, comprising:

a plate comprising a substantially planar surface disposed in a first plane; and

a plurality of louvers provided in said plate and adapted to dissipate heat from said plate, each of said plurality of louvers comprising a substantially planar surface disposed in a respective second plane that intersects said first plane at a corresponding angle, each of said plurality of louvers further comprising a plurality of side edges including an integral side edge connected to said plate.

17. (Once Amended) A computer storage system comprising:

a hard disk drive having a heat emitting motor; and

a shield attached to said hard disk drive, said shield comprising:

a plate comprising a substantially planar surface disposed in a first plane;

and

a plurality of louvers provided in said plate and adapted to dissipate heat from said plate, each of said plurality of louvers comprising a substantially planar surface disposed in a respective second plane that intersects said first plane at a corresponding angle, each of said plurality of louvers further comprising a plurality of side edges including an integral side edge connected to said plate.

23. (New) The shield according to Claim 9, wherein the second plane, in which each of the plurality of louvers are disposed, intersects the first plane, in which the plate is disposed, intersect at an acute angle.

24. (New) The computer storage system of Claim 17, wherein the second plane, in which each of the plurality of louvers are disposed, intersects the first plane, in which the plate is disposed, intersect at an acute angle.